SSGIC

General Meeting
December 12, 2001
Direction, Analysis Results

(**Bold** text of individuals names indicate a responsibility on that individuals part)

Overview of SSGIC Project
Pat Lineback presented an overview of the Southern Sierra Geographic Information Cooperative (SSGIC). It is an interagency cooperative with five primary stakeholder agencies, Bakersfield BLM, CDF-Tulare unit, Kern Co. Fire Dept., Sequoia National Forest, and Sequoia & Kings Canyon National Parks. The project's primary goal is to develop a landscape scale framework for interagency fuels management. The SSGIC website is located at http://ssgic.cr.usgs.gov. It is still under development. The meeting goals were to introduce the web site, review the current status of fire analysis, discuss next generation of analysis products, and evaluate future web development and analysis. Appendix A is a list of meeting participants.

Web Site Development
ArcIMS is the software, which allows display of maps across the Internet. In late November, SSGIC paid tuition for 5 interagency staff to attend ArcIMS training at ESRI in Redlands including Craig French from Sequoia NF, Karen Folger from Sequoia & Kings Canyons NPs', Jolia Koo from Southern Region Headquarters, CDF, Maria Soto from Bakersfield BLM, and Anne Birkholz from SSGIC. These individuals will be the agency point-of-contact for uploading agency data to the web site, developing maps for display on the web, and providing agency support for the web site. These individuals will be meeting in Porterville on Friday, December 14 to discuss specifics of web mapping from the SSGIC web site. **John Guthrie** will continue to provide ArcIMS and web support. **Elissa Adams** will continue to provide GIS analysis and technical support as well as data management support to the web site.

Functionality currently available on the web site includes:

- **Map Portal** for users to create their own maps. To create a map will only require your web browser and access to the Internet; no other software is required. The watershed overview map service is nearly complete. As a user zooms into the map, increasing levels of detail appear down to the 7.5 minute 1:24,000quadrangles. In the next month or so, we expect to have available all first generation analyses including FOA, FRID, and FlamMap (These analyses are described later in this document). Thanks to John Guthrie, USGS computer specialist from Denver, for much of the web development and Elissa Adams, USGS contractor from Denver, who is providing much of the GIS technical support for this project.

- **Download site** for users to download GIS data files and corresponding metadata. This will soon include a variety of base cartographic layers, data contributing to the analyses (e.g.

fuels, vegetation, canopy cover, DEM's, fire ignitions, and fire perimeters) and the analyses results.

- **Document site** from which users can view all documents relating to SSGIC in Adobe Acrobat format.

- **Links to other related sites**

Comments on and recommendations for Web site design and content are welcome and may be directed to Anne Birkholz.

Current Analysis Status
Jeff Manley presented an overview of the SSGIC flowchart for fire management analyses as developed by an analysis team in May, 2000. We are very near completion of the first phase of the analysis which includes the FOA (Fire Occurrence Areas, Potential Risk), FRID (Fire Return Interval Departure, Potential Ecological Value) , and FlamMap (Potential Hazard). Jeff discussed the pilot Fire-MAP project, which is a national project to provide managers with a common interagency process to evaluate the effectiveness of alternative fire management strategies to meet land management goals and objectives. It will replace several existing agency specific budget and analysis systems such as NFMAS, FIREPRO, and FIREBASE. The SSGIC goals fit in well with the Fire-MAP project and he sees possibilities for linking the two.

Anne Birkholz presented an overview of the logic of the FOA and FRID analyses and their current status. Brent Skaggs provided the same for FlamMap:

- FOA – This analysis represents the potential risk of a fire ignition occurring and is derived from historic ignition data. The Analysis was completed and will soon be available on the web to download data or create a web-based map using your Internet browser. Constraints applied to the dataset include using only 1981-2000 ignitions, eliminating management fire ignitions, and clipping agency datasets to their respective boundaries. Both human caused and lightening ignition were included.

- FlamMap – This analysis represents the hazard potential for a fire at each location across the landscape. It is derived using the FlamMap model of fire behavior (similar to Farsite). Model inputs include fuels, canopy cover, and topographic data. FlamMap also requires weather data derived from FireFamily software and RAWS. Outputs include fireline intensity, spread rate, flame length, heat/unit area, and crown fire activity. A comparison of RAWS weather station data was passed out and Brent is hoping to fine tune this with the help of fuels folks. Completion of this analysis is expected by mid-January and will be posted on the web. Thanks to Heidi Hosler and Brent Skaggs for much of the work on developing the inputs to and running FlamMap.

- FRID – This analysis is based on extensive research identifying fire as a keystone natural process within the Sierra Nevada and provides an index to rank areas based on the need to restore historic fire regimes. Source data include a vegetation layer (currently with

vegetation codes crosswalked to WHR (Wildlife Habitat Relationship) vegetation types and historic fire perimeters. A Fire Return Interval (FRI) is assigned to each WHR vegetation type which represents the historical (preEuropean settlement) burn intervals. The model uses the historic fire perimeter data to calculate how many FRI's have elapsed since the last recorded fire across the landscape. FRID analysis is nearly completed and will be available from the web site in January. FRID outputs for the Sequoia National Forest and Sequoia & Kings Canyon National Parks were previously completed and available for inspection.

These analyses will be available on the web site by January 15, 2002 **(Anne Birkholz, Heidi Hosler, Brent Skaggs, Elissa Adams**)

Direction for the Future

- Potential modifications to second generation analyses. Revisit this after completion of the first generation analyses are complete:

  - FOA – Resolve issues with source datasets as described below under "Other Topics Discussed". Potential for additional FOA analyses on datasets based on cause codes or date of ignition to evaluate the effect of fire cause and/or ignition month on the analyses.

  - FRID – Confidence in FRI values is good for woody vegetation types with dendrochronological records, but scarce for shrub and herbaceous types; more data is needed for these types. Improve the FRID model to include additional variables such as aspect and slope in assigning the FRI values. There was consensus on the need to develop a DRID model. This Disturbance Return Interval Departure model would look at current land use and management activities in addition to vegetation types. This would include agricultural activities, fuels treatments, mechanical disturbance, and other changes to the potential vegetation community which would significantly alter the FRI value.

  - FlamMap – Utilize improved fuels and canopy cover data as it becomes available and acquire optional data for crown height, crown bulk density, and tree height. Expand the weather inputs to include additional weather influence zones. Potential to analyze alternative scenarios such as variable wind direction and speed, modified defaults for global crown characteristics,

- Asset Analyzer – Robin Marose presented an overview CDF's Asset Analyzer. The analyzer captures what the expected loss will be if a large, damaging fire occurs. Source data for identified resources are maintained as GIS polygons or buffered points and/or lines with values such as low, medium, or high are assigned. The user applies relative weights to each resource (e.g. housing weighted more heavily than grazing). The model then sums the values across all the resources and calculates an aggregate score. The output is a surface of the scores, generally High, Medium, and Low. Robin discussed the relative merits of the polygon as well as cell (CDF's Quad 81$^{st)}$ approach. Polygon approach requires time consuming processing each time it is run and the outputs can be very fragmented and difficult to interpret. The disadvantage of the Quad 81st is the low resolution (about 480

acres). It was suggested we combine both approaches and develop a low resolution summary coverage to identify "hot spots" and also be able to focus on detailed, high resolution outputs. We will develop a raster approach to the analysis to improve processing efficiency. First generation analysis will focus on a limited number of resources to demonstrate the proof of concept. Next generation will focus on ranking systems and spatial data for additional resources**.** **Robin Marose** will provide data for the entire analysis area for hydropower, soil erosion, water storage, water supply, range and 1990 housing density as surrogate for structures to Anne Birkholz by Jan. 31, 2002. **Tony Caprio** will be the lead on developing a GIS layer and ranking scale of Sequoia groves as a special interest asset. **Bill Kaage** will develop a firefighter safety model using the fuels layer as surrogate with terrain features as modifiers. **Elissa Adams** will perform the technical work in developing the spatial data for firefighter safety. **John Guthrie** and **Anne Birkholz** will investigate software available to implement the Asset Analyzer and the potential for developing a web-based interface. First generation Asset Analyzer to be completed by April 15, 2002

- WFSI (Wildfire Susceptibility Index) – This model combines the outputs from FOA and FRID into probability of burning index. Don Carlton was previously contracted to assist with this model. **Anne Birkholz** will contact him again to assist in completing the WSFI by April 15, 2002.

- Standardizing Business Practices – A goal of the SSGIC is to "*develop standard business processes that optimize long term, interagency information collaboration that are implemented and effectively communicated.*" Pat Lineback presented several alternatives to pursue ranging from:

  1. Doing nothing – cancel the goal
  2. Drafting a letter from agency heads describing the problem, offering solutions, and asking them to take the lead in resolution
  3. Use an outside contractor to look at selected current business processes in each agency and develop a synthesized improved business model for a "better way of doing business"
  4. Develop our own standards and guidelines and garner support for them nationally

  After considerable discussion, the consensus was to identify a few existing business models and selectively evaluate using a contractor. Three potential projects identified include: a) Fuels/Canopy data development and management, b)Fire history/burn severity, and c) Fire Analysis Planning. The objective for SSGIC will focus on dissecting a few existing business models and developing recommendations, but not actually implementing them. It is beyond the scope of this project to implement business model changes in such a short time period. A Request for Proposal (**Pat Lineback** lead) will need to be developed with an appropriate scope of work. Actively plugging into other existing national efforts to develop data standards and guidelines was also suggested.

Other Topics Discussed

- Project Management Software – Dorothy Albright presented an overview of the "Microsoft Project" project management software, particularly the ease with which users can modify inputs and generate an updated critical path that allows identification of the consequences of a particular task not being completed on time. UC Davis Cooperative Extension provided SSGIC with a full version of the software. Dorothy Albright has entered much of the SSGIC action plan into Microsoft Project. **MaryBeth Keifer** and **Anne Birkholz** will update the action plan using Microsoft Project.

- Kern County FireSafe Council – Chuck Dickson expressed the Council's interest in fuels management and the desire to network with the SSGIC. They have contracted with Tim Walsh to develop a plan by April focusing on assets and fuels. Tim is anxious to acquire whatever fuels and vegetation data is available. **Anne Birkholz** will pass best available fuels and vegetation to him ASAP.

- Technical issues related to combining datasets using historic ignition data. - As an example, Anne Birkholz presented a synopsis of some of the technical issues encountered in assembling the ignition data for the FOA analysis. These types of issues are common, time consuming, and expensive. It demonstrates the need and value of developing data standards and standard workflow processes. Several types of issues found were:

  - Geospatial location - Collection of incorrect coordinates in the field as well as variable precision or accuracy depending on collection protocols or differences between individuals.

  - Inconsistency of existing databases elucidated by comparing the same dataset obtained from multiple sources – Inconsistencies were found in both the number of years of data available as well as degradation of geospatial coordinates for ignition points.

  - Questionable data – With the exception of the Sierra NF and Sequoia & Kings Canyon National Parks, 22% to 50% of each agencies total ignition points fell outside of their respective boundaries. It is not known if these ignitions points are redundant, errors, or valid

  - Ability to merge datasets – Each agency maintains data in it's own proprietary data format resulting in a technical difficulties when combining data from multiple sources.

  - Relationship to fire perimeter data – A comparison of ignition point and fire perimeter data demonstrated that there are fire perimeters without corresponding ignition points

- Level of support SSGIC can provide to FireSafe Councils and similar groups – The group discussed what kind of support might be provided, how this would impact SSGIC, and the relationship to the SSGIC mission. Potential support might include hosting web sites, posting data, providing map services, etc. Impacts would include providing ArcIMS administrative support and data management. Additional concerns are security issues and our contractual agreement with the USGS for web support and data storage behind their firewall. It was noted that CDF provides FireSafe council's with web space, but they do not

have ArcIMS capability to provide mapping services. No decision was made; it will be re-evaluated as the need arises.

- Next general meeting scheduled for April 17, 2002 at the Sequoia National Forest supervisor's office in Porterville, CA (same as current meeting)(**ALL**)

Appendix A
SSGIC Meeting Participants, 12/12/01

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